UNITED STATES PATENT AND TRADEMARK OFFICE

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10/799,533	03/11/2004	Yang Gao	0160112	8500

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EXAMINER
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ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/799,533	GAO, YANG
	Examiner	**Art Unit**
	JAKIEDA R. JACKSON	2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 June 2008*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,13,15,17-27,29,31,33-36,39-43,46,48,49 and 51-56* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11, 13, 15, 17-27, 29, 31, 33-36, 39-43, 46, 48, 49 and 51-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.　　In response to the Office Action mailed May 6, 2008, Applicant submitted an

amendment filed on June 10, 2008 in which the applicant traversed and requested

reconsideration.

Response to Arguments

2.　　Applicant argues that Bergstrom does not disclose, teach or suggest

decomposing a wideband speech signal into a voiced portion and a noisy portion using

an adaptive separation component having a filter cut-off frequency, wherein said voiced

portion is a portion of said input wideband speech signal for waveform matching and

said noisy portion of said input wideband speech signal not for waveform matching, and

wherein said filter cut-off frequency is above 4kHz further comprising removing said

background noise from said input wideband speech signal before decomposing said

input wideband speech signal into said voiced portion and said noisy portion. The

examiner agrees.

　　　　Applicant argues that Andersen does not disclose, teach or suggest

decomposing a wideband speech signal into a voiced portion and a noisy portion using

an adaptive separation component having a filter cut-off frequency, wherein said voiced

portion is a portion of said input wideband speech signal for waveform matching and

said noisy portion of said input wideband speech signal not for waveform matching, and

wherein said filter cut-off frequency is above 4kHz further comprising removing said

background noise from said input wideband speech signal before decomposing said

input wideband speech signal into said voiced portion and said noisy portion. The examiner agrees.

Applicant argues that Zinser does not disclose, teach or suggest decomposing a wideband speech signal into a voiced portion and a noisy portion using an adaptive separation component having a filter cut-off frequency, wherein said voiced portion is a portion of said input wideband speech signal for waveform matching and said noisy portion of said input wideband speech signal not for waveform matching, and wherein said filter cut-off frequency is above 4kHz further comprising removing said background noise from said input wideband speech signal before decomposing said input wideband speech signal into said voiced portion and said noisy portion. The examiner agrees.

Applicant's arguments are persuasive in view of Kaajas. Kaajas discloses a method wherein said filter cut-off frequency is above 4kHz (expanded bandwidth frequencies is over 4kHz; paragraph 0019), to enhance spatial processing. Therefore, Bergstrom, Andersen, Zinser and Kaajas disclose all elements as recited in claims 1 and 17.

The finality of the previous office action is withdrawn in favor of a new final rejection which is made final in view of the changes to the claims in the amendment filed 2/12/08 necessitating new grounds of rejections. The Office regrets any inconvenience to applicant.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   **Claims 1, 3-5, 7-11, 13, 15, 17, 19-21, 23-27, 29, 31, 33-36, 39-43, 46, 48, 51,**

53 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergstrom

et al. (USPN 5,809,459), hereinafter referenced as Bergstrom in view of Andersen et al.

(PGPUB 20060153286), hereinafter referenced as Andersen and in view of Zinser, Jr.

et al. (USPN 6,138,092), hereinafter referenced as Zinser and in further view of Kaajas

et al. (PGPUB 2004/0138874), hereinafter referenced as Kaajas.

Regarding **claims 1 and 17**, Bergstom discloses a method and apparatus of

processing speech comprising:

obtaining an input wideband (expand the bandwidth, paragraph 0019) speech

signal (input speech; column 3, line 63 – column 4, line 24);

processing said voiced portion of said input wideband speech signal to obtain a

first set of parameters using analysis by synthesis approach (analysis and synthesis

processor; column 3, line 63 – column 4, line 24); and

processing said noise portion of said input wideband speech signal to obtain a

second set of parameters using open loop approach (open loop; column 12, lines 5-22),

but does not specifically teach decomposing said input wideband speech signal,

transmitting said first set of parameters and wherein said filter cut-off frequency is above 4kHz.

Andersen discloses a method and apparatus wherein said voiced portion is a portion of said input wideband speech signal for waveform matching and said noisy portion of said input wideband speech signal not for waveform matching (analysis-by-synthesis; paragraph 0043) , and wherein said filter cut-off frequency is above 4kHz (8kHz; paragraph 0045), to improve performance.

Zinser teaches a method wherein it transmit said first set of parameters, said second set of parameters and a voicing index to a decoder, wherein said voicing index provides filter cut-off frequency for signal decomposition (cut off frequency; column 12, line 24 – column 13, line 2), to ensure effective performance.

Kaajas discloses a method wherein said filter cut-off frequency is above 4kHz (expanded bandwidth frequencies is over 4kHz; paragraph 0019), to enhance spatial processing.

As shown above, all the claimed elements were known in the prior art, as evidenced in the above references, and one skilled in the speech processing art could have combined the elements by merely adding them together, with no change in their respective function, and the combination would have yielded predictable results or the sum of the respective functions, to one of ordinary skill in the art at the time of the invention, KSR International Co. v. Teleflex Inc., 550 U.S.--,82 USPQ2nd 1385 (2007).

Regarding **claims 3 and 19**, Bergstrom discloses a method and apparatus wherein said separation component is a lowpass filter (lowpass filter; column 6, lines 29-66).

Regarding **claims 4 and 20**, Bergstrom further discloses a method and apparatus, wherein bandwidth of said lowpass filter is dependent upon a characteristic of said input speech (lowpass filter; column 6, lines 29-66).

Regarding **claims 5 and 21**, Bergstrom further discloses a method and apparatus wherein said characteristic of said input speech is pitch correlation (pitch; column 6, lines 29-66).

Regarding **claims 7 and 23**, Bergstrom in view of Andersen disclose everything as claimed in claims 1 and 17. In addition, Andersen further discloses a method and apparatus wherein said analysis by synthesis approach is a Code Excited Linear Prediction (CELP) process (columns 1—2, paragraphs 0019-0022).

Regarding **claims 8, 24, 34 and 41**, Bergstrom further discloses a method and apparatus wherein said first set of parameters comprises pitch of said voiced portion of said input speech (pitch; column 6, lines 29-66).

Regarding **claims 9, 25, 35 and 42**, Bergstrom further discloses a method and apparatus wherein said first set of parameters comprises excitation of said voiced portion of said input speech (excitation; column 6, lines 29-66 and column 8, lines 19-26).

Regarding **claims 10, 26, 36 and 43**, Bergstrom further discloses a method and apparatus wherein said first set of parameters comprises energy of said voiced portion of said input speech (energy; column 8, lines 19-26).

Regarding **claims 11 and 27**, Bergstrom further discloses a method and apparatus wherein said second set of parameters comprises characteristics of a voicing index of said input speech (index; column 6, lines 29-66 and column 7, lines 22-53).

Regarding **claims 13 and 29**, Bergstrom further discloses a method and apparatus wherein said decoder device uses said information regarding said first set of parameters to synthesize said voiced portion of said input speech (synthesized speech; column 4, lines 6-13).

Regarding **claims 15 and 31**, Bergstrom further discloses a method and apparatus wherein said decoder device uses said information regarding said second set of parameters to synthesize said noise portion of said input speech (synthesized speech; column 4, lines 6-13).

Regarding **claims 33 and 40**, it is interpreted and rejected for the same reasons as set forth in claims 1 and 17. In addition, Bergstrom further discloses an apparatus and method for synthesizing speech comprising:

a first module for obtaining a first set of parameters regarding a voiced portion of an input speech signal (input speech; column 3, line 63 – column 4, line 24);

a second module for obtaining a second set of parameters regarding a noise portion of said input speech signal (noise; column 20, lines 1-33);

a third module for synthesizing said voiced portion of said input speech signal

from said first set of parameters approach (analysis and synthesis processor; column 3,

line 63 – column 4, line 24);

a fourth module for synthesizing said noise portion of said input speech signal

from said second set of parameters (noise; column 20, lines 1-33; and

a fifth module for combining said synthesized voiced portion and said

synthesized noise portion to produce a synthesized version of said input speech

(synthesize; column 4, lines 6-24), but does not specifically teach decomposing said

input speech into a voiced portion and a noise portion using an adaptive separation

component.

Andersen teaches audio signal processing using CELP comprising decomposing

said input speech into a voiced portion and a noise portion using an adaptive separation

component (separate voiced/unvoiced; columns 1-2, paragraphs 0019-0022), to

increase the coding gain.

Regarding **claims 39 and 46**, it is interpreted and rejected for the same reasons

as set forth in claims 1 and 17. In addition, Zinser further teaches a speech processing

method and apparatus wherein said synthesized noise portion is estimated (estimated;

column 2, lines 22-34 and column 3, lines 16-32).

Regarding **claims 48, 51, 53 and 55**, it is interpreted and rejected for the same

reasons as set forth in claims 1 and 17. In addition, Zinser further teaches a speech

processing method and apparatus wherein said filter cut-off frequency (cut off

frequency) is communicated to said decoder using a plurality of bits in said voicing

index (voiced) to indication to said decoder which filter to use for said signal

decomposition (abstract, column 2, lines 22-34 and column 3, lines 16-32 with column

12, line 24 – column 13, line 2).

5.   **Claims 2 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable

over Bergstrom in view of Andersen, Zinser and Kaajas and in further view of Accardi et

al. (PGPUB 20054/0055219), hereinafter referenced as Accardi.

Regarding **claims 2 and 18**, Bergstrom in view of Andersen, Zinser and Kaajas

disclose a method and apparatus for signal and decomposition of voiced speech, but

does not specifically teach comprising removing said background noise from said input

wideband speech signal before decomposing said input wideband speech signal into

said voiced portion and said noisy portion.

Accardi discloses a method and apparatus comprising removing said background

noise from said input wideband speech signal before decomposing said input wideband

speech signal determining excitation after determining the speech and noise part) into

said voiced portion and said noisy portion (figure 3 with paragraphs 0014 and 0025-38),

for speech enhancement.

Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to modify Bergstrom in view of Andersen, Zinser and

Kaajas' method and apparatus, as described above, to generate a robust and flexible

speech enhancement and coding process that exhibits better performance (paragraph

0042).

6.   **Claims 6 and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable

over Bergstrom in view of Andersen Zinser and Kaajas and in further view of Gigi

(USPN 6,453,283).

Regarding **claims 6 and 22**, Bergstrom in view of Andersen, Zinser and Kaajas

disclose a method and apparatus for processing speech, but does not specifically teach

wherein said characteristic of said input speech is gender of a person uttering said input

speech.

Gigi teaches a speech processing method and apparatus wherein said

characteristic of said input speech is gender of a person uttering said input speech

(speech preferably is sex-specific; column 12, lines 23-45), to improve the overall

quality.

Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to modify Bergstom in view of Andersen, Zinser and

Kaajas' method and apparatus, as taught by Gigi, to enable the production of more

natural speech (column 1, lines 65-67).

7.   **Claims 49, 52, 54 and 56** are rejected under 35 U.S.C. 103(a) as being

unpatentable over Bergstrom in view of Andersen, Zinser and Kaajas, and in further

view of Li et al. (PGPUB 2007/0110042), hereinafter referenced as Li.

        Regarding claims **49, 52, 54 and 56**, Bergstrom in view of Andersen, Zinser and

Kaajas disclose a method and apparatus for processing speech, but do not specifically

teach wherein said voicing index defines a plurality of low pass filters.

        Li discloses a speech processing method and apparatus wherein said voicing

index defines a plurality of low pass filters (column 22, paragraphs 0250-0251 with

column 27, paragraphs 0280-0281), to optimize the performance.

        Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to modify Bergstrom in view of Andersen, Zinser and

Kaajas' method and apparatus wherein said voicing index defines a plurality of low pass

filters, as taught by Li, to multiply the down-sampled signal by cosine and sine, which

optimizes the performance (column 22, paragraphs 0250-0251).

Conclusion

8.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

9.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to JAKIEDA R. JACKSON whose telephone number is

(571)272-7619. The examiner can normally be reached on Monday-Friday from

5:30am-2:00pm.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, David Hudspeth can be reached on 571-272-7843. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JRJ
June 20, 2008
/David R Hudspeth/
Supervisory Patent Examiner, Art Unit 2626